

IN THE CLAIMS

Please amend the claims to read as follows:

Listing of Claims

1. (Currently Amended) A modulation apparatus comprising:

a first frequency-increasing single side band (SSB) SSB modulator that performs SSB modulation on a first input symbol to obtain an upper side band (USB) a USB signal;  
a second frequency-increasing SSB modulator that performs SSB modulation on a second input symbol to obtain a lower side band (LSB) LSB signal; and  
a combiner that combines the USB signal and the LSB signal,  
wherein the second frequency-increasing SSB modulator performs SSB modulation to  
obtain the LSB signal using a carrier frequency higher than a carrier frequency used in the first frequency-increasing SSB modulator by the fundamental frequency of the input symbol.

2. (Withdrawn) A demodulation apparatus comprising:

a first frequency-decreasing demodulator that demodulates an input modulation signal by a cosine curve with a predetermined carrier frequency to obtain a first demodulation signal; and  
a second frequency-decreasing demodulator that demodulates an input modulation signal by a sine curve with a carrier frequency higher than the carrier frequency used in the first frequency-decreasing demodulator by the fundamental frequency of a symbol.

3. (Withdrawn) A demodulation apparatus comprising:

a detector that performs quadrature detection on an input modulation signal by a predetermined carrier frequency to obtain a first detection signal and a second detection signal; an analog/digital converter that quantizes the first detection signal and the second detection signal with an over-sampling frequency four times or more an entire bandwidth of the detection signal;

a FFT circuit that performs Fourier transform on the first detection signal and the second detection signal quantized; and

a signal detector that detects a signal before being modulated based on an output signal of the FFT circuit, using a signal in each carrier frequency and another signal in an adjacent frequency on a USB or LSB side.

4. (Currently Amended) A modulation method comprising:

an upper side band (USB) a-USB signal forming step of performing single side band (SSB) SSB modulation on a first input symbol to obtain a USB signal;

a lower side band (LSB) LSB signal forming step of performing SSB modulation on a second input symbol to obtain an [[a]] LSB signal; and

a combining step of combining the USB signal and the LSB signal,

wherein, in the LSB signal forming step, SSB modulation is performed using a carrier frequency higher than a carrier frequency used in the USB signal forming step by the fundamental frequency of the input symbol.

5. (Withdrawn) A demodulation method comprising:

a first demodulation step of demodulating a modulation signal by a cosine curve with a predetermined carrier frequency to obtain a first demodulation signal; and

a second demodulation step of demodulating a modulation signal by a sine curve with a carrier frequency higher than the carrier frequency used in the first demodulation step by the fundamental frequency of an symbol.

6. (New) A demodulation apparatus for demodulating a signal combined by the combiner in the modulation apparatus according to claim 1, the demodulation apparatus comprising:

a first frequency-decreasing demodulator that demodulates an input modulation signal by a cosine curve with a predetermined carrier frequency to obtain a first demodulation signal; and

a second frequency-decreasing demodulator that demodulates an input modulation signal by a sine curve with a carrier frequency higher than the carrier frequency used in the first frequency-decreasing demodulator by the fundamental frequency of a symbol.

7. (New) A demodulation apparatus for demodulating a signal combined by the combiner in the modulation apparatus according to claim 1, the demodulation apparatus comprising:

a detector that performs quadrature detection on an input modulation signal by a predetermined carrier frequency to obtain a first detection signal and a second detection signal;

an analog/digital converter that quantizes the first detection signal and the second detection signal with an over-sampling frequency four times or more of an entire bandwidth of the detection signal;

a fast Fourier transform (FFT) circuit that performs Fourier transform on the first detection signal and the second detection signal quantized; and

a signal detector that detects a signal before being modulated based on an output signal of the FFT circuit, using a signal in each carrier frequency and another signal in an adjacent frequency on a USB or an LSB side.

8. (New) A demodulation method of demodulating a signal combined in the combining step of the modulation method according to claim 4, the method comprising:

a first demodulation step of demodulating a modulation signal by a cosine curve with a predetermined carrier frequency to obtain a first demodulation signal; and

a second demodulation step of demodulating a modulation signal by a sine curve with a carrier frequency higher than the carrier frequency used in the first demodulation step by the fundamental frequency of a symbol.